(54) Title: SUBSCRIBER IDENTIFY MODULE, METHOD OF AUTOMATICALLY ACTIVATING AN APPLICATION ON SUCH A MODULE AND SYSTEM TO CARRY OUT SUCH A METHOD

(57) Abstract: A Subscriber Identity Module (312) is pro-
vided for use in a mobile station (102; 306; 402), comprising
an Operating System, a file system comprising a file (315;
502); and at least one application (317, 318, 319), which can
be activated from an external device. The Subscriber Iden-
tity Module (312) further comprises an event listener (314)
arranged to detect a storing of data in a file on the Subscriber
Identity Module (312), and based on reading the data stored
in the file (315; 502), determining which application (317,
318, 319) on the Subscriber Identity Module (312), if any,
to activate. Moreover a method of activating an application
(317, 318, 319) on a Subscriber Identity Module (312) for
use in a mobile station (102; 306; 402) is provided, wherein
the application (317, 318, 319) can be activated from an ex-
ternal device.

WO 03/051067 A2

GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK (utility model), SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) **Designated States** *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SI, SK,

TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

1

Subscriber Identity Module, method of automatically activating an application on such a module and system to carry out such a method

Background

5   This invention relates to a Subscriber Identity
Module for use in a mobile station, wherein the
Subscriber Identity Module comprises an Operating System,
a file system comprising a file; and at least one
application which can be activated from an external
10   device; the invention further relates to a use of a
Subscriber Identity Module in a mobile station. Finally,
the invention relates to a method of activating an
application on a Subscriber Identity Module for use in a
mobile station, wherein the application can be activated
15   from an external device.

Today, mobile stations, typically known as mobile
cellular telephones, are widespread and used all the time
in everyday life. Since they comprise not only means for
communicating with base stations that are arranged in a
20   cellular network, but also have complex processing power,
an advanced man-machine interface, MMI, and near-range
wireless communications means – and further are light in
weight, they are well-suited platforms for various
applications. Such applications can be involved in the
25   automation of the tasks with which a user is faced
his/her mobile everyday life – for instance tasks such as
payments, drawing a ticket, gaining access to a computer
system or a building, etc. Typically, the application in
the mobile station will interact wirelessly with some
30   type of external station.

Even though the mobile station may provide advanced
features, a user will always require an easy and fast

2

interaction with the mobile station. Hence, in order to provide a successful application this must be accounted for in terms of response times and user interfaces requiring as few operations as possible.

5   To comply with the above requirement to a user interaction, an interesting option is to provide remote (i.e. from an external station) and automatic activation of an application on the mobile station. Hereto, experience has shown that typical response times over the

10   cellular network e.g. according to GSM or UMTS are too slow for real-time interaction with a program application. Consider for instance response times involved in sending/receiving a Short Message according to the GSM Short Message Service. Although it is a matter

15   of only a few seconds it is considered too slow, e.g. if the mobile station is used as a payment transaction unit. It should be noted that SMS messages are typically used to transfer short text messages between mobile stations.

        In this context, the near-range, but wireless

20   communication capability is a cardinal point in obtaining a satisfactory solution additionally since, generally, a user expects a true wireless solution.

        The near-range wireless communication is obtainable by means of infrared communications e.g. IrDa or RF

25   communications e.g. Bluetooth©. Thereby, local data transfer to and from an external unit is possible.

        It should be noted that applications in a mobile station are often – and especially for the above-mentioned applications –embodied on a Subscriber Identity

30   Module, a so-called SIM card. This involves problems in that the communication between the mobile station and the

SIM is governed by standards given by the ETSI organisation.

A SIM card is essentially a single-chip computer with an Operating System, a file system, and at least one application. The main purpose of a SIM card is to provide a security module for customer authentication, which is owned and trusted by the network operator.

Prior art

US patent 5,887,266 discloses a method of using one or more applications on a SIM card in a mobile station. The application has a first and a second mode of operation. In the first mode the application is passive, but in the second mode the application controls a master control unit of the mobile station. Switching between the first and second state can be accomplished by three different types of operation: 1) The so-called power-up type, whereby the application switches to the second mode of operation as soon as possible after the mobile station is switched on and/or the module card is inserted, 2) The menu type, in which the user can select the application he wishes to be active, e.g. from a menu shown on the display of the mobile station, and 3) Automatic type, in which the application switches to a second mode of operation when a certain condition, defined for the application has been satisfied. This automatic type of application can become active in the GSM system, when the mobile station receives a specific SMS message containing a so-called Hayes AT command. The US patent 5,887,266 states an example of the event code used, from which it appears that the AT commands used are of the following types: AT+CDIS, AT+CIND, and AT+CMGS. Also provided is a

system for making payments, comprising at least one mobile station which has an associated payment application, a component for using the application and a first transceiver (IR and/or RF) for providing local data
5 transfer in conjunction with a cash register or the like with a corresponding transceiver (IR respectively RF).

However, this prior art involves the problem that presently mobile stations are not supported to response to Hayes AT commands of the type AT+CMGS, which is a
10 command to send an SM point to point. It is questionable whether this command, which is normally used to send an SM from e.g. a personal computer application to a network, will be able to operate with mobile telephones, and at present vendors of standard mobile stations are
15 not supporting this type of command.

If the command AT+CMGS would work on a mobile station, this mobile station should inherently be featured to support such a command and it will thus be a command for direct activating an application on the SIM card. The US
20 patent 5,887,266 does not state any other means of activating automatic applications on the SIM card in case of lack of support of the used commands.

Additionally, it is a problem in the prior art that
25 the automatic type of operation, which as indicated above often appears to be the most sought-after, is restricted to be activated when and only when the mobile station receives a specific SMS (Short Message Services) message via the cellular communications system. Thereby, the
30 automatic type of operation can only be used (activated) through the GSM network. No automatic operation activated through a local link (e.g. IrDa) has been disclosed.

Neither do the GSM or ETSI specifications provide for such automatic activation.

Hence, providing both fast response time and automatic activation of an application in the mobile station is not
5 an option.

Summary of the invention

The above and other problems are solved when the Subscriber Identity Module mentioned in the opening
10 paragraph is characterized in further comprising an event listener arranged to detect a storing of data in a file on the Subscriber Identity Module, and based on reading the ·data stored in the file, determining which application on the Subscriber Identity Module, if any, to
15 activate.

Thereby, an application on the Subscriber Identity Module according to the invention can be activated automatically in a manner that is with certainty supported by mobile telephones presently on the market,
20 which telephones are typically using either the GSM, TDMA, or CDMA telephone technology. Moreover, the activation of the application on the Subscriber Identity Module is performed without user interaction and thereby provides a simple, fast and faultless manner of
25 interacting with external units.

Thus, an external unit can activate an application residing on the SIM over a near-range communications link. Thereby, it is possible to prompt a user of the mobile station to provide some information via the MMI of
30 the mobile station to an external unit, which in turn has initiated the prompting by activation of an application in the SIM. Alternatively, the external station can

6

obtain the information without prompting the user. Thereby, the user is relieved of the task of navigating through menus, which may require a lot of attention. This is especially expedient at a busy point-of-sale (PoS). In other words, there is provided a solution where e.g. a cash register can write data, e.g. a payment order, to a specific SIM file, the phone book or the SMS file or another file. The SIM recognises a certain flow of events to thereby be able to trig a SIM application.

In a preferred embodiment, the detection of the storing of data is performed by detecting a write command to a file, wherein at said detection, an index becomes available; said detection results in reading of the data stored in the file at the index; and the determining of which application to activate is performed by comparing data at the index witha specified data pattern. Hereby, the activation of an application on the Subscriber Identity Module is performed in a simple, fast and faultless manner.

The detection of the storing of data can be performed by detecting from the mobile station to the SIM: a select file command and/or a seek/find a free index command and/or an update record command.

In yet a preferred embodiment the Subscriber Identity Module (312) comprises means for selecting a file in the Subscriber Identification Module; means for identifying an index at which data can be stored; and means for storing data at a position indicated by the index. The file can be the Short Message file, a phone book file or

other file on the SIM. The index works as a pointer to the stored data.

In yet a preferred embodiment the Subscriber Identity Module (312) further comprises means arranged for reading an application ID from a predefined position in a record that is identified by an index obtained in conjunction with a storing; means for comparing the application ID with a registered ID; and means for initialising an application associated with the registered ID upon said comparison of the application ID with the registered ID. Preferably, the ID is registered in a file on the SIM. It can be determined that the data were actually stored when an index is received.

In another preferred embodiment the Subscriber Identity Module (312) further comprises means for reading a command at a position determined by the index from the application associated with the registered ID. Thereby an application can be activated with a specific command.

When the Subscriber Identity Module (312) further comprises means for transmitting said index to an external unit, data can be read from the external unit.

When the Subscriber Identity Module (312) further comprises means for calculating a digital signature identifying a user uniquely, the user can simply accept to authenticate him/her when prompted by an automatically activated application.

When the Subscriber Identity Module (312) further comprises means for writing an output from an application to a record at the same index, an external unit at a predefined location can find the output or result
5   generated by an activated application.

When the Subscriber Identity Module (312) further comprises a memory for registering the applications, it is possible to store a plurality of applications.
10

When the at least one application (317, 318, 319) in the Subscriber Identity Module (312) comprises a payment application for performing payment transactions, the Subscriber Identity Module can be used to perform payment
15   transactions.

The invention further relates to a method of activating an application (317, 318, 319) on a Subscriber Identity Module (312) for use in a mobile station (102;
20   306; 402), wherein the application (317, 318, 319) can be activated from an external device; the method is characterized in comprising the steps of: detecting a storing of data in a file on the Subscriber Identity Module (312), which storing of data can be caused by the
25   external device; reading the data stored in the file; and if the data stored in the file match a specified data pattern, activating an application on the Subscriber Identity Module (312).
     Thereby, an external unit can activate an application
30   residing on the SIM (312) over a near-range communications link, rendering it possible to prompt a user of the mobile station to provide some information

9

via the MMI of the mobile station to an external unit, which in turn has initiated the prompting by activation of an application in the SIM.

5   According to a preferred embodiment, detecting of the storing of data is performed by detecting a write command to a file, wherein at said detecting, an index becomes available; and wherein said detection results in reading of the data stored in the file at the index; and wherein

10   the determining of which application to activate is performed by comparing data at the index with a specified data pattern. Hereby, the activating of an application on the Subscriber Identity Module is performed in a simple, fast and faultless manner.

15

In a preferred embodiment of the method the data to be stored are received in a mobile station (102; 306; 402) by means of a modem (308), via a data port (307) that is arranged to provide local data transfer. The

20   modem (308) can be embodied in the mobile station (102; 306; 402) either as hardware or as software.

When the data to be stored are received in a mobile station (102; 306; 402) via so-called AT commands to the

25   modem (308) well known communications mechanisms can be used in communicating with external units.

In a preferred embodiment of the method according to the invention the AT commands is an AT command arranged

30   to Write Message to Memory. This could for example be of the AT-CMGW type.

When the method comprises the step of converting the
AT commands to ETSI commands that request data storage on
the Subscriber Identification Module, access from an
external unit to the SIM is provided.

5

The method can comprise the step of issuing a command
to the mobile station (102; 306; 402). Thereby an
activated application can issue a proactive command of
displaying, playing sound, etc. This can be used for e.g.
10   attracting a user's attention.

Additionally, the method can comprise the steps of,
from an external unit: transmitting a write command of
starting an application to the mobile station (102; 306;
15   402); and polling the mobile station (102; 306; 402) with
a read command to receive an output generated as a
consequence of starting the application.

Throughout this description, the term "event
20   listener" indicates a specific portion CP of the SIM
Operating System. The event listener is arranged, in
accordance with the invention, to register a writing
operation to a file and subsequently to forward an index
that points to a record in the file to a SIM application
25   controller. It should be noted that the event listener
could also be a separate unit connected to the SIM
Operating System.

Moreover, the term "local data transfer" is meant to be
30   opposed to a data transfer performed over a radio
communications network by means of satellites and by use
of radio connections or over a computer network. In local

11

data transfer, the units typically communicate directly
with each other without intermediate equipment. Typically
the units performing the local data transfer are at a
distance from each other of between about 40 cm to about
5   1 m; in come cases, though, the units performing the
local data transfer are up to about 10 m from each other.
However, the term "local data transfer" is not meant to
limit the distance between the units communicating,
rather, it is conceivable that the units could be at
10   other distances from each other. The local data transfer
could for instance be performed by means of Infrared
signals (IR signals) or Bluetooth© signals.

Further preferred embodiments of the method according
15   to the invention are stated in the other dependent
claims. Moreover, the invention relates to the use of a
Subscriber Identity Module in a mobile station (102; 306;
402) and a system.

20   Brief description of the drawings
The invention will be explained more fully below in
connection with a preferred embodiment and with reference
to the drawing, in which:
fig. 1 shows a block diagram of a mobile station in
25   communication with a cash terminal via a local data link;
fig. 2 shows a block diagram of a mobile station in
communication with a server via cellular communications
system;
fig. 3 shows a block diagram of a terminal and a
30   mobile station 306 with a subscriber identity module 315
according to the invention;

fig. 4 shows a combined sequence diagram and flowchart; and

fig. 5 shows a combined block diagram and flowchart.

5   Description of a preferred embodiment

Fig. 1 shows a block diagram of a mobile station 102 in communication with a terminal via a local data link. According to the invention, the terminal TRM 101 is able to activate an application in the mobile station 102 via
10 the local data link, LCO_DL.

In a preferred embodiment, the terminal is comprised of a cash register CR 104 and a so-called pay-box PB 103.

The cash register 104 can be a common cash register with means for communicating with the pay-box e.g. via a
15 RS-232 protocol. The cash register can communicate e.g. an amount payable to the pay-box. Subsequently, and according to a scheme to be explained further below, the pay-box can return a message indicating whether a transaction has been approved.

20 The pay-box 103 is arranged to provide the communication with the mobile station 102 via the local data link LCO_DL and optionally to provide communication via a channel on a communications network 105, preferably the Internet, to a payment clearance centre. The payment
25 clearance centre can be interfaced to the Internet via a WEB or bank server coupled to a Bank's Mainframe server 107.

The local data link LCO_DL is preferably in accordance with the IrDA or Bluetooth standard. Since, according to
30 the invention commands to the mobile station 102 can be forwarded to activate an application on a Subscriber Identity Module in the mobile station, user interactions

13

with the mobile station can be accomplished for in a fast
and smooth way.

It should be noted that the boxes SD 100 and BD 108
enclose the equipment used at e.g. a shop's domain and a
5   Bank's domain, respectively.

Fig. 2 shows a block diagram of a mobile station 102
in communication with a server via a cellular
communications system. It is shown that the mobile
10 station 102 can be used in a cellular communications
system e.g. the GSM or UMTS system. This cellular
communications system, comprising operator's equipment
203 and 204, can also provide communication between the
mobile station and the bank. However, this is not a part
15 of the present invention.

It is also shown that the WEB server 106 in addition
to the communication with the pay-box 103 can be used to
provide a home-banking application.

20   Fig. 3 shows a block diagram of a terminal and a
mobile station with a subscriber identity module
according to the invention. The mobile station MS 306 and
the terminal CR 301 can be considered as being known to a
person skilled in the art. However, for the sake of
25 completeness and in order to operate in conjunction with
the present invention, the terminal must comprise a data
port 302 providing local communication with the mobile
station 306. A preferred data port could be a port in
accordance with the IrDa or Bluetooth© standard.
30 Moreover, the terminal comprises a main processing unit
CP 303, a network port providing communication over a

data network e.g. the Internet, and a man-machine
interface MMI 304.

Correspondingly, in order to operate in conjunction
with the present invention, the mobile station MS 306
5   must comprise a data port 307 providing local
communication with the terminal. Moreover, the mobile
station 306 comprises a modem 308, a master control unit
309, a man-machine interface 311, and RF cellular
communications means 310 e.g. in accordance with the GSM
10   or UMTS system.

The mobile station 306 can accommodate a subscriber
identity module, SIM 312, communicating with the mobile
station over an interface.

15   In the mobile station 306, the modem 308 operates in
combination with the data port 307 to transmit and
receive so-called Hayes AT commands ATC by means of which
the mobile station and the terminal communicate. The AT
commands are terminated in the modem and at least a
20   subset of the AT commands are converted to ETSI 11.11 and
11.14 commands that enables writing over the MS/SIM
interface for writing to files SIM MEM 315, 502 on the
SIM card. Such a file can be the so-called Short Message
SM file.
25

Writing, reading and other basic functions are
executed by an Operating System SIM OS 313 on the SIM
312. A specific portion CP 314, a so-called event
listener, of the SIM OS 313 is arranged, in accordance
30   with the invention, to register a writing operation to a
file (e.g. the SM file) and subsequently, to forward an
index that points to a record in the file to a SIM

application controller SIM APP CTRL 320. Thereby, it is, based on reading the data stored in the file, determined which application on the Subscriber Identity Module, if any, should be activated.

5   Based on the index, the SIM application controller 320 examines the record to find a pointer in an Application Trigger Registry ATR 316 pointing to an application App #1 317; App #2 318; App #3 319 to activate. Please note that when only one out of one application can be

10   activated from an external unit, the Application Trigger Registry 316 can be constituted by a single entry.

Fig. 4 shows a first combined sequence diagram and flow chart. Generally, the punctuated lines designate

15   time lines for respective units designated with reference numerals 401 to 405. The lines extending perpendicular to the time lines designate exchange of information between any two units 401 to 405. The boxes located on a time line of a unit designate a processing step in the unit.

20   The units involved are an external unit, which can request execution of an application on the SIM card; a mobile station MS 402; a SIM Operating System SIM OS 403; a SIM Application Controller SIM APP CTRL 404; and a SIM Application SIM APP 405.

25   The external unit 401 initiates activation of an application on the SIM by transmitting a message comprising a command to the application and an Application Trigger Identifier ATI, at a predetermined position in the message. Said ATI determining which

30   application to activate.

Upon request from the external unit 401 an AT write command AT WR_CMD is transmitted via a data port to a

modem in the mobile station 402. Subsequently, the mobile station 402 selects a file on the SIM via the SIM Operating System. In response thereto the SIM OS returns an index to a record that is free. The mobile station
5   will return that index IDX to the external unit for subsequent use. When the index is returned, data received with the AT write command will be written to the free record by means of an update record command UPD_REC.

In step 407 it is tested whether this write command is
10 carried out successfully, and in the affirmative, the index IDX will be forwarded from the SIM OS to the SIM Application Controller. The message send from the external terminal is thus stored in the record.

In step 408, the SIM Application Controller receives
15 the index and reads the record identified by the index at a predefined position TIDPOS in the record at which the Application Trigger Identifier ATI resides.

In step 409, it is verified whether the ATI exists in an Application Trigger Register ATR. If it exists, an
20 associated application (see reference numerals 317 to 319) on the SIM is activated and the index IDX is forwarded to the activated application. The activated application reads the record at the index in step 411 RD CMD in rec@IDX to examine whether there are any commands
25 to execute. Such a command can be a command to the mobile station by means of the MMI displaying text/images, playing a sound, etc.

In response thereto the mobile station can fetch data (FTCH) from the application. Hence, the SIM application
30 is in command by telling the mobile station what to do by means of the FTCH command.

While the above-mentioned processing is carried out in the mobile station and on the SIM, the external unit 401 can poll the mobile station 402 for data provided as a result of activating a specified application. The polling

5 can be carried out by means of AT read commands (AT RD_CMD). The AT read command specifies the location to read at by means of the index IDX received as a response to the AT write command (AT WR_CMD).

In step 412 the external unit has received a response

10 obtained by activating an application on the SIM.

In a preferred embodiment, the file on the SIM is the Short Message (SM) file.

In case the mobile station 402 is used for taking part

15 in a Mobile Payment Service MPS in conjunction with a cash register as the external unit 401, an example of the possible steps performed is given below:

First, the cash register sends a request "Sign payment" to the mobile station using a Write Message to

20 Memory command, typically an AT+CMGW command. Thereafter, the mobile station selects the SM file, finds the next free index and updates the record. The SIM Operating System 403 searches the record for a specific data pattern. If the data pattern is found, then the SIM

25 Operating System activates SIM application performing the Mobile Payment Service, the so-called MPS SIM application. The MPS SIM application returns a signal (for instance "91XX") to the mobile telephone to indicate that the mobile station has more commands to be executed.

30 The mobile telephone thereafter returns the index of an SM file to the cash register, where the SM was written as a response to the AT command. Finally, the mobile

18

telephone fetches the other commands from the MPS SIM application for the MMI interaction and the MPS SIM application calculates a signature and writes the result to the same index in the SM file.

5

Fig. 5 shows a combined block diagram and flowchart. A memory MEM 501 on the SIM comprises a SM file 502, which is known to a person skilled in the art, and an Application Trigger Registry 504.

10   The SM file 502 comprises records each of which is commonly used to store a Short Message. Such a Short Message may be delivered via the local data port to the modem and further on to the SM file as described in the above. According to the invention a Short Message can

15 comprise a command CMD and a trigger ID TID, which command is to be interpreted by an activated application specified by the trigger ID, TID. The above-mentioned index which is received from the SIM OS is used as a pointer to the record, whereas the position in the record

20 at which the trigger ID TID can be found, can be stored on the SIM as a pre-defined position TIDPOS. Hence, with the knowledge of the pre-defined position, an external unit can write the ID of an application to be activated.

The Application Trigger Registry 604 comprises a list

25 of records with ID's of applications, which can be activated by an external unit. The ID's may themselves comprise information which can be used to activate a corresponding application or, alternatively, the ID's can be linked to such information.

30   Turning now to a description of the processing on the SM file and the Application Trigger Registry.

In step 505 and upon an event of receiving the above mentioned index IDX from the SIM OS, in a process according to the invention, the TID is read from the record identified by the index IDX at the pre-defined
5   position TIDPOS in the record. In step 506, which can be carried out by a search engine, this TID is searched for in the ATR 504. If a match is found, step 507 will forward processing to step 609 in which the application with the found TID is activated. Alternatively, if no
10   match is found, processing will be forwarded to step 508, in which an index from the SIM OS will be waited for. The latter scenario will happen when an ordinary SMS message is received.

15   Generally, it should be noted that no particular distinction is made between the term "Mobile Station MS" that typically designates "Mobile Equipment ME and SIM", whereas, typically, the term "Mobile Equipment" does not include the SIM. Additionally, no specific distinction is
20   made between the terms mobile cellular telephone, mobile station, mobile telephone, mobile phone, mobile terminal, mobile radio communications unit, mobile communications unit, cellular phone or mobile.

Moreover, the pay-box may also be denoted a payment
25   terminal.

Finally, it should be stressed that the invention is not limited to a mobile telephone, inasmuch as it might as well be used in any mobile equipment containing a SIM card and cellular communications means, e.g. a PDA with
30   cellular communications means.

Applications:

The terminal can be a cash terminal, a cash register, a ticket-issuing machine, an information stand or desk, an access controller etc.

21

Patent Claims

1. A Subscriber Identity Module (312) for use in a
mobile station, wherein the Subscriber Identity Module

5   comprises:

a file (315; 502); and

at least one application (317, 318, 319), which can
be activated from an external device;

characterized in that the Subscriber Identity Module

10   (312) comprises:

an event listener (314) arranged to detect a storing
of data in a file on the Subscriber Identity Module
(312), and based on reading the data stored in the file,
determining which application (317, 318, 319) on the

15   Subscriber Identity Module (312), if any, to activate.

2. A Subscriber Identity Module (312) according to
claim 1, wherein detection of the storing of data is
performed by detecting a write command to a file, wherein

20   at said detection, an index becomes available; and
wherein said detection results in reading of the data
stored in the file at the index; and wherein the
determining of which application to activate is performed
by comparing data at the index with a specified data

25   pattern.

3. A Subscriber Identity Module (312) according to
claim 1 or 2, further comprising:

means for selecting a file (315; 502) in the

30   Subscriber Identification Module (312);

means for identifying an index at which data can be
stored; and

22

means for storing data at a position indicated by the index.

5   4. A Subscriber Identity Module (312) according to any of the claims 1 to 3, further comprising:
        means arranged for reading an application ID from a predefined position in a record that is identified by an index obtained in conjunction with a storing;
        means for comparing the application ID to a
10   registered ID; and
        means for initialising an application associated with the registered ID upon said comparison of the application ID with the registered ID.

15   5. A Subscriber Identity Module (312) according to any of the claims 1 to 4, further comprising:
        means for reading a command at a position determined by the index from the application associated with the registered ID.
20

        6. A Subscriber Identity Module (312) according to any of the claims 1 to 5, further comprising:
        means for transmitting said index to an external unit.
25

        7. A Subscriber Identity Module (312) according to any of the claims 1 to 6, further comprising:
        means for calculating a digital signature identifying a user uniquely.
30

        8. A Subscriber Identity Module (312) according to any of the claims 1 to 7, further comprising:

means for writing an output from an application to a
record at the same index.

     9. A Subscriber Identity Module (312) according to
5   any of the claims 1 to 8, further comprising a memory for
registering the applications.

     10. A Subscriber Identity Module (312) according to
any of the claims 1 to 9, wherein the at least one
10   application (317, 318, 319) comprises a payment
application for performing payment transactions.

     11. Use of a Subscriber Identity Module (312)
according to any of the claims 1 to 9 in a mobile station
15   (102; 306; 402).

     12. A method of activating an application (317, 318,
319), on a Subscriber Identity Module (312) for use in a
mobile station (102; 306; 402), wherein the application
20   (317, 318, 319) can be activated from an external device;
the method is characterized in comprising the steps of:
    detecting a storing of data in a file on the
Subscriber Identity Module (312), which storing of data
can be caused by the external device;
25   reading the data stored in the file;
    if the data stored in the file match a specified data
pattern, activating an application on the Subscriber
Identity Module (312).

30   13. A method according to claim 12, wherein detecting
of the storing of data is performed by detecting a write
command to a file, wherein at said detecting, an index

24

becomes available; and wherein said detection results in reading of the data stored in the file at the index; and wherein the determining of which application to activate is performed by comparing data at the index to a

5   specified data pattern.

14. A method according to claim 12 or 13, wherein the data to be stored are received in a mobile station (102; 306; 402) by means of a modem (308), via a data port

10   (307) that is arranged to provide local data transfer.

15. A method according to claim 14, wherein the data to be stored are received in a mobile station via so-called AT commands to the modem (307).

15

16. A method according to claim 15, wherein the AT commands is an AT command arranged to Write Message to Memory.

20   17. A method according to any of the claims 14 to 16 further comprising the step of: converting the AT commands to ETSI commands that request data storage on the Subscriber Identification Module (312).

25   18. A method according to any of claims 12 to 17 comprising the steps of:

selecting a file in the Subscriber Identification Module (312);

identifying an index at which data can be stored; and

30   storing data at a position indicated by the index.

19. A method according to any of claims 12 to 18 comprising the steps of:

if storing of data was actually carried out, reading an application ID from a predefined position in a record that is identified by an index obtained in conjunction with the storing; and

if the application ID matches a registered ID, starting an application associated with the registered ID.

20. A method according to claim 19 comprising the step of: from the application associated with the registered ID, reading a command at a position determined by the index.

21. A method according to claim 20 comprising the step of: issuing a command to the mobile station (102; 306; 402).

22. A method according to claim 21 comprising the step of, from an external unit:

transmitting a write command of starting an application to the mobile station (102; 306; 402); and

polling the mobile station (102; 306; 402) with a read command to receive an output generated as a consequence of starting the application.

23. A method according to any of claims 17 to 22 comprising the step of: transmitting the index to an external unit.

24. A method according to any of claims 12 to 23 comprising the step of calculating a digital signature identifying a user uniquely.

5   25. A method according to any of claims 17 to 24 comprising the step of: writing an output from an application to a record at the same index.

26. A system comprising:
10   a mobile station 102; 306; 402) with a Subscriber Identity Module (312) and a communication port (307) arranged to provide local data transfer;
   an external unit arranged to communicate with the mobile station via a local data port (302);
15   characterized in that
   the system is arranged to carry out the method as set forth in any of claims 12 to 23.

27. A system according to claim 26, wherein the local
20   data port (302) is of the IR type.

28. A system according to claim 26, wherein the local data (302) port is of the Bluetooth © type.
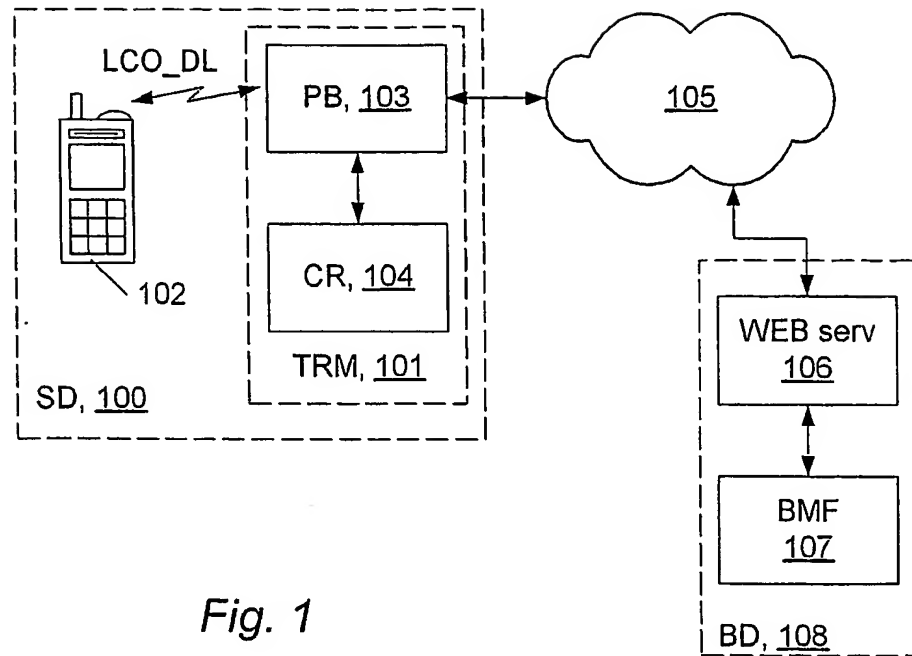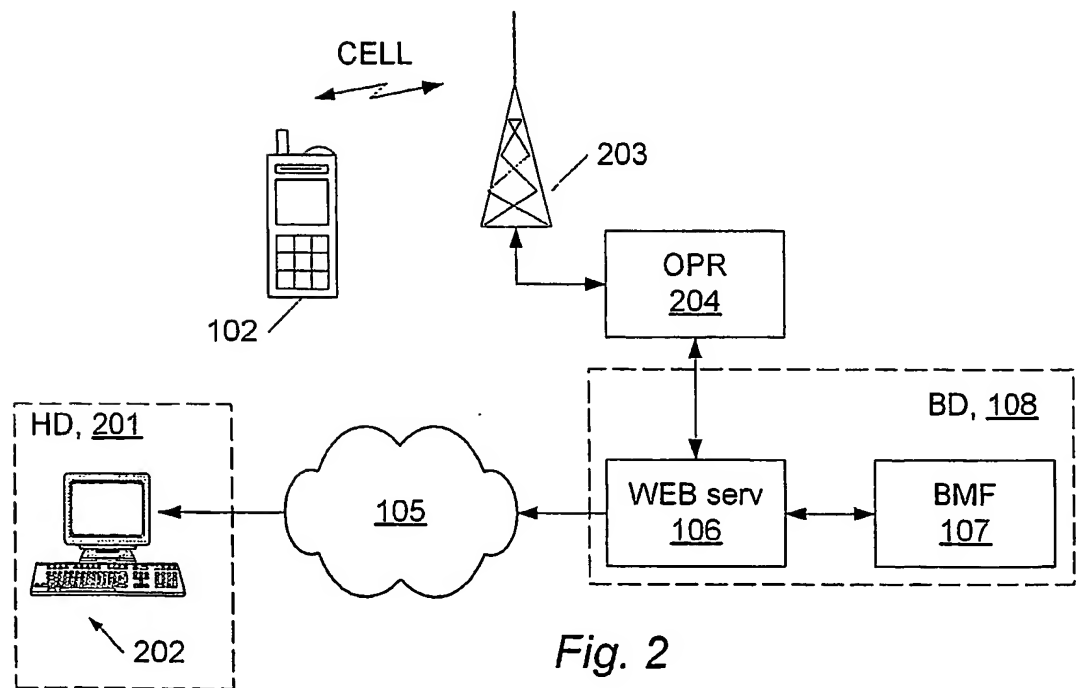
25
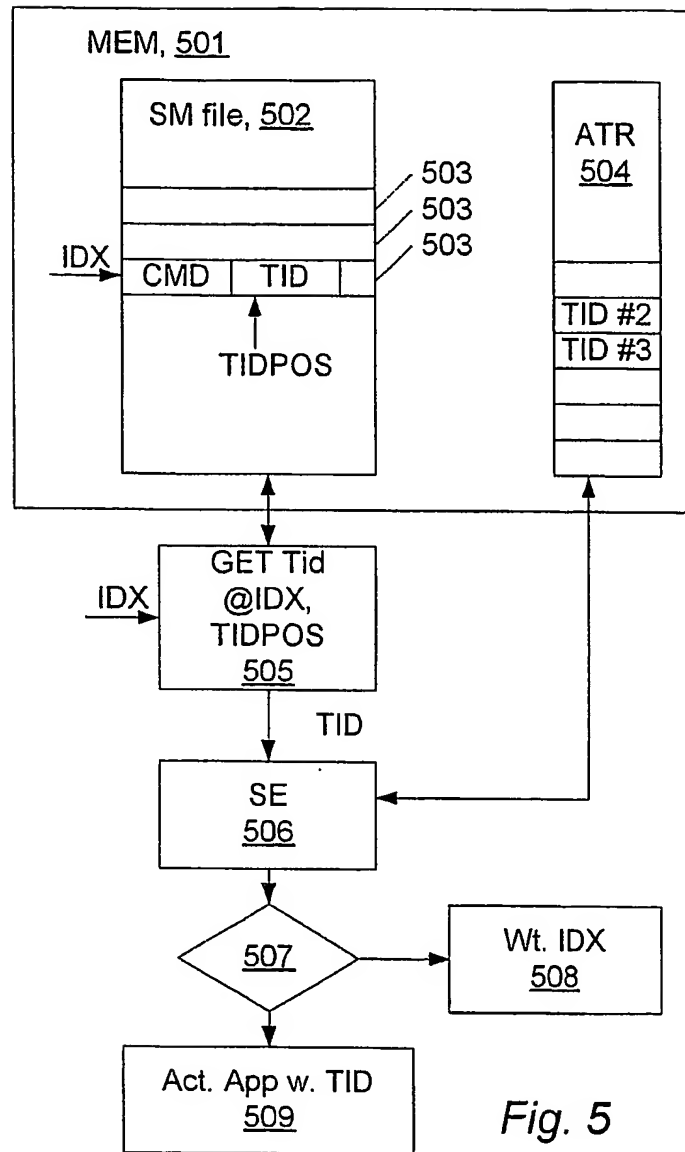
LCO_DL

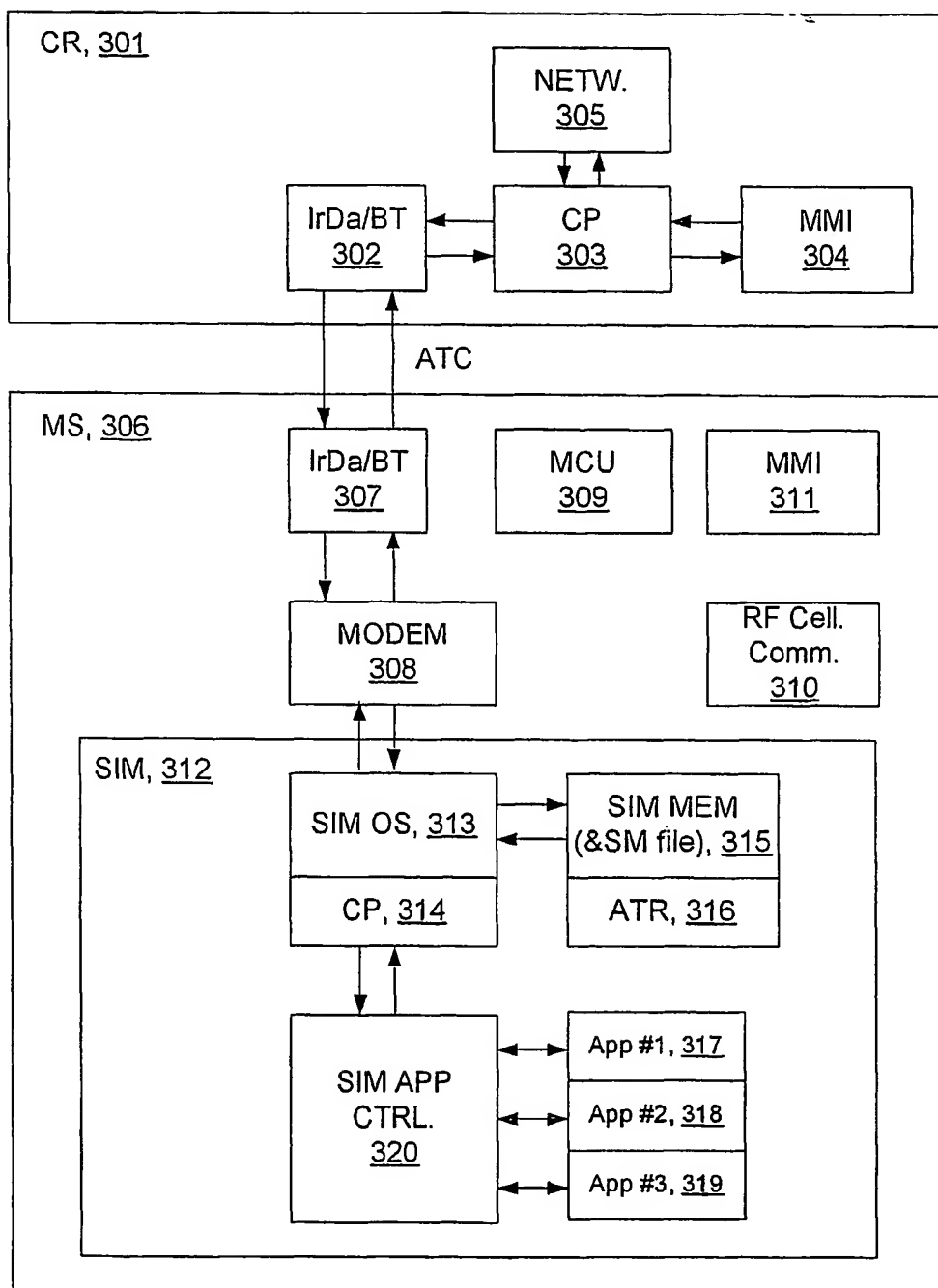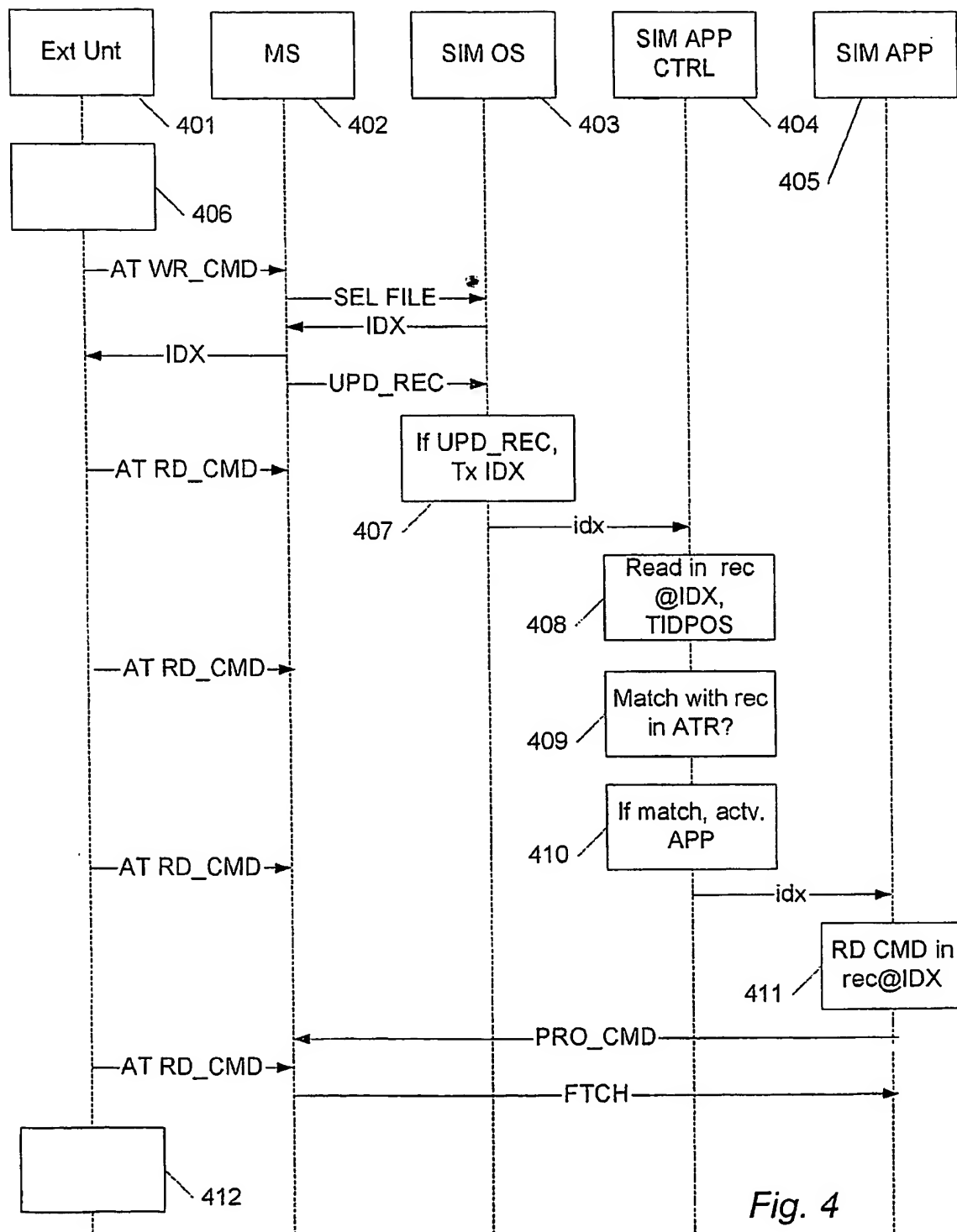PB, 103

CR, 104

TRM, 101

SD, 100

105

WEB serv
106

BMF
107

BD, 108

Fig. 1

CELL

203

102

OPR
204

HD, 201

105

BD, 108

WEB serv
106

BMF
107

202

Fig. 2

Fig. 3

Fig. 4

Fig. 5

(51) International Patent Classification⁷: G07F 7/10, H04Q 7/32

(21) International Application Number:
PCT/DK2002/000835

(22) International Filing Date:
10 December 2002 (10.12.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
PA 2001 01835   10 December 2001 (10.12.2001)   DK

(71) Applicant *(for all designated States except US)*: BEAMTRUST A/S [DK/DK]; Borupvang 1A, DK-2750 Ballerup (DK).

(72) Inventors; and
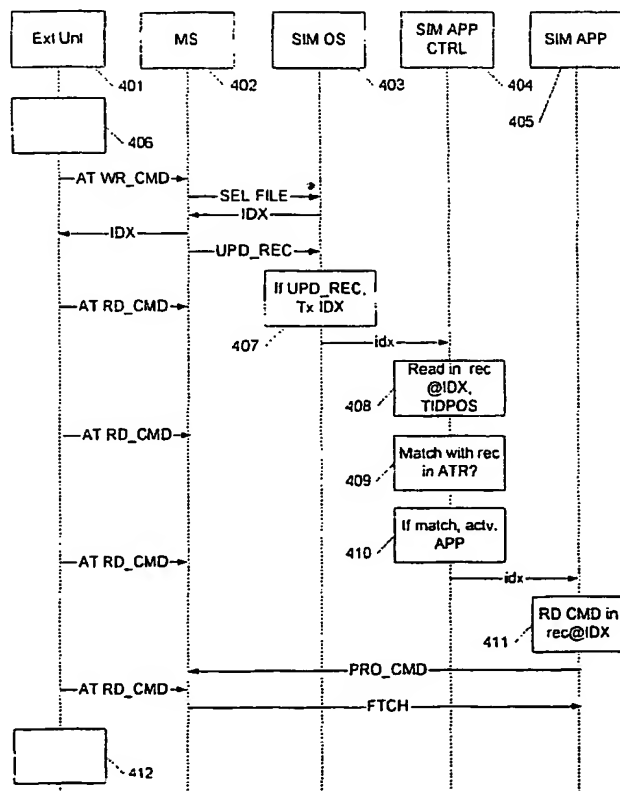(75) Inventors/Applicants *(for US only)*: ELGAARD, Robert [DK/DK]; Stænget 11, DK-2820 Gentofte (DK). KAARLE, Peter [SE/SE]; Lackes gränd 7, S-244 95 Furulund (SE). ANDERSSON, Sten [SE/SE]; Bryggaregatan 12, S-227 36 Lund (SE). ESSEN, Cecilia [SE/SE]; Skyttelinjen 86, S-226 49 Lund (SE). ELOFSSON, Tomas [SE/SE]; Bäckarännan 7, S-227 63 Lund (SE). ANDERSSON, Richard [SE/SE]; Häckeberga Smedja, S-240 13 Genarp (SE). KAPNOULA, Anna [SE/SE]; Västra Stationstorget 14, S-222 37 Lund (SE). ANDERSSON, Christer [SE/SE]; Lingsg. 1C,3tr, S-271 42 Ystad (SE). HJORT, Staffan [SE/SE]; Novelvägen 60, S-211 50 Malmö (SE).

(74) Agent: ZACCO DENMARK A/S; Hans Bekkevolds Allé 7, DK-2900 Hellerup (DK).

(81) Designated States *(national)*: AE, AG, AL, AM, AT (utility model), AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ (utility model), CZ, DE (utility model), DE, DK (utility model), DK, DM, DZ, EC, EE (utility model), EE, ES, FI (utility model), FI, GB, GD, GE,

[Continued on next page]

(54) Title: SUBSCRIBER IDENTIFY MODULE, METHOD OF AUTOMATICALLY ACTIVATING AN APPLICATION ON SUCH A MODULE AND SYSTEM TO CARRY OUT SUCH A METHOD

(57) Abstract: A Subscriber Identity Module (312) is provided for use in a mobile station (102; 306; 402), comprising an Operating System, a file system comprising a file (315; 502); and at least one application (317, 318, 319), which can be activated from an external device. The Subscriber Identity Module (312) further comprises an event listener (314) arranged to detect a storing of data in a file on the Subscriber Identity Module (312), and based on reading the data stored in the file (315; 502), determining which application (317, 318, 319) on the Subscriber Identity Module (312), if any, to activate. Moreover a method of activating an application (317, 318, 319) on a Subscriber Identity Module (312) for use in a mobile station (102; 306; 402) is provided, wherein the application (317, 318, 319) can be activated from an external device.

WO 2003/051067 A3

GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK (utility model), SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

(88) Date of publication of the international search report:
26 February 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

	Internatior ı Application No
	PCT/DK 02/00835

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7   G07F7/10   H04Q7/32

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7   G07F   H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 382 778 A (K. TAKAHIRA) 17 January 1995 (1995-01-17) abstract; claims; figures column 4, line 11 –column 6, line 11 ---	1,2,4,9, 10, 12-16, 19-22,26
A	FR 2 776 788 A (GEMPLUS) 1 October 1999 (1999-10-01) abstract; claims; figures ---	1,2,4-6, 9,10,12, 19-22,26
A	EP 1 073 023 A (ALCATEL) 31 January 2001 (2001-01-31) abstract; claims; figures column 13, line 4 –column 14, line 32 ---	1,4,12, 14,26-28
	-/--	

[X] Further documents are listed in the continuation of box C.   [X] Patent family members are listed in annex.

° Special categories of cited documents :

'A' document defining the general state of the art which is not considered to be of particular relevance

'E' earlier document but published on or after the international filing date

'L' document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

'O' document referring to an oral disclosure, use, exhibition or other means

'P' document published prior to the international filing date but later than the priority date claimed

'T' later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

'X' document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

'Y' document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

'&' document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
6 June 2003	16/06/2003

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl. Fax: (+31–70) 340–3016	David, J

Form PCT/ISA/210 (second sheet) (July 1992)

Internation|	lication No
PCT/DK 02/00835

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 973 350 A (PHONE.COM) 19 January 2000 (2000-01-19) abstract; claims; figures ---	1-5,12, 14,18, 21,22,26
A	WO 01 52575 A (SONERA) 19 July 2001 (2001-07-19) abstract; claims; figures page 8, line 30 -page 9, line 35 ---	1,3,4, 9-12,18, 21,22,26
A	WO 98 58509 A (GENERALDIREKTION PTT) 23 December 1998 (1998-12-23) abstract; claims; figures page 8, line 29 -page 10, line 28 -----	1,4,5,9, 10,12, 14,15, 21,22, 26-28

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 5382778	A	17-01-1995	JP	2690229 B2	10-12-1997
			JP	5151409 A	18-06-1993
			DE	4239806 A1	27-05-1993
			GB	2261973 A ,B	02-06-1993
FR 2776788	A	01-10-1999	FR	2776788 A1	01-10-1999
			AU	2841499 A	18-10-1999
			CA	2324905 A1	30-09-1999
			CN	1302421 T	04-07-2001
			EP	1072024 A1	31-01-2001
			WO	9949426 A1	30-09-1999
			JP	2002508551 T	19-03-2002
EP 1073023	A	31-01-2001	DE	19934981 A1	01-02-2001
			AU	4509200 A	01-02-2001
			CA	2313940 A1	26-01-2001
			CN	1282191 A	31-01-2001
			EP	1073023 A2	31-01-2001
			JP	2001092900 A	06-04-2001
EP 0973350	A	19-01-2000	US	6292833 B1	18-09-2001
			CN	1246773 A	08-03-2000
			EP	0973350 A2	19-01-2000
			JP	2000092050 A	31-03-2000
			KR	2000016949 A	25-03-2000
WO 0152575	A	19-07-2001	FI	20000062 A	13-07-2001
			AU	2853001 A	24-07-2001
			EP	1247413 A1	09-10-2002
			WO	0152575 A1	19-07-2001
WO 9858509	A	23-12-1998	WO	9858509 A1	23-12-1998
			AT	215291 T	15-04-2002
			AT	212774 T	15-02-2002
			AU	736350 B2	26-07-2001
			AU	3022497 A	04-01-1999
			AU	739465 B2	11-10-2001
			AU	5649598 A	04-01-1999
			WO	9858510 A1	23-12-1998
			CN	1260939 T	19-07-2000
			DE	59706821 D1	02-05-2002
			DE	59802969 D1	14-03-2002
			DK	990355 T3	01-07-2002
			DK	990356 T3	29-04-2002
			EP	0990355 A1	05-04-2000
			EP	0990356 A1	05-04-2000
			ES	2172870 T3	01-10-2002
			HU	0003157 A2	29-01-2001
			HU	0003565 A2	28-03-2001
			JP	2002511217 T	09-04-2002
			JP	2002510444 T	02-04-2002
			NO	996145 A	16-02-2000
			NO	996148 A	11-02-2000
			NZ	501858 A	28-09-2001
			NZ	501859 A	28-08-2002
			TW	480449 B	21-03-2002

Form PCT/ISA/210 (patent family annex) (July 1992)